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# Chatting with Bots or Talking to Robots?

## Exploring User Experience Differences Between Chatbot and Social Robot Interfaces

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# Abstract

As conversational agents become increasingly prevalent in educational contexts, it remains unclear how text-based chatbots and embodied social robots differ in terms of user experience. This study addresses that precisely that, using a conversational agent called Bookbot, which is designed to have book discussions with 10- to 11- year-olds. Bookbot was applied to two interfaces, one text-based chatbot interface and the other a social robot interface called Furhat. Ten university students was recruited were they had one interaction with each interface. Employing a mixed-methods design, quantitative data were collected via the User Experience Questionnaire (UEQ) and qualitative insights through thematic analysis through semi-structured interviews. Although no statistically significant differences emerged on any UEQ scale, descriptive trends indicated superior performance of the chatbot on pragmatic dimensions (perspicuity, efficiency, dependability) and overall attractiveness, whereas the robot excelled on novelty and stimulation. Thematic analysis revealed that the chatbot's clarity and predictable pacing fostered ease of comprehension and control, while the robot's face and voice generated stronger social presence but suffered from turn-taking breakdowns and speech delivery issues. These findings highlight complementary strengths in the two interfaces: chatbots deliver functional stability and clarity, while social robots enable richer social engagement. Accordingly, design implications include integrating minimalist social cues into chatbots and enhancing the conversational robustness of social robots. Future research should employ issue-based metrics and longitudinal social-presence measures to distinguish novelty effects from sustained user engagement.

# Acknowledgement

I would like to express my deepest gratitude to my supervisors, Emma Mainza Chilufya and Mattias Arvola. Without their encouragement and expertise, this thesis would not have been possible.

Linköping in June 2025

Felix Lind

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# 1. Introduction

As interactions with chatbots and robots become increasingly common in our daily lives, these technologies offer promising contributions across various fields. In education, for instance, both chatbots and social robots have the potential to enhance classroom engagement and foster a more interactive learning environment.
The Bookbot Project is a research project initiated to boost reading engagement among 10- to 11- year-olds, addressing a decline in reading interest observed in recent years. The project aims to explore whether social robots can be utilized to increase interest in reading by facilitating book discussions and recommending books that align with each child's reading proficiency (Chilufya et al., 2025).

# 2. Research Question

The primary aim of this study is to investigate the differences in user interaction and experience between a social-robot interface and a chatbot interface. Based on the insights gained, this report will offer design recommendations and directions for future research. Accordingly, the research questions are as follows:
**(1)** How do users' experiences differ when using a social-robot interface compared with a chatbot interface?

a. What usability issues arise?
b. What are the differences in the user experience?

# 3. Background

In recent years, conversational systems such as chatbots and social robots have become increasingly popular in various sectors, one of them being education. While both interfaces offer opportunities to support learning, they differ significantly in how they engage users. Chatbots are accessible and efficient but often lack the richness of social presence and cannot replicate a social and emotional interaction as one that is done face-to-face can (Samala et al., 2024, p.107). Social robots, on the other hand, can create more humanlike, engaging interactions but come with their own challenges such as technical limitations, cost, and usability concerns.

Despite growing interest in both types of interfaces, there is still limited research comparing how users actually experience interacting with them, especially in a shared tasks like a book discussion. Understanding these differences is important for designing more effective and engaging chatbots and social robots. This study focuses on exploring what each interface brings to the table and how their strengths can be combined.

This study employs the same conversational system, Bookbot, across both interfaces. Bookbot is a prototype conversational system designed to foster a passion for books and reading, acting as a companion in the world of literature (Chilufya et al., 2025, p.11).

To ground the comparative analysis of embodied and text-based conversational agents, this study employs the same conversational system, Bookbot, across both interfaces. Bookbot is a prototype conversational system designed to foster a passion for books and reading, acting as a companion in the world of literature (Chilufya et al., 2025, p. 11). The results from the semi-structured interviews, combined with the UEQ data, will serve as the basis for comparing user interactions with Bookbot as a physical social robot versus a text-based chatbot. These comparisons, in turn, will yield insights into the differing the user experiences and inform concrete design implications for future conversational interfaces.

## 3.1 Social Robots

According to Shourmasti et al. (2021) social robots can be defined as follows "*a physical entity embodied in a complex dynamic, and social environment sufficiently empowered to behave in a manner conducive to its own goals and those of its community*".

This view of social robots as physically embodied entities is likewise highlighted by Breazeal et al (2016). According to Breazeal et al. (2016, p. 1936) the design of a social robot for interaction aims to promote engagement in an interpersonal manner. Breazeal et al. explains that it is often in the form of a partner to achieve positive outcome in domains such as education, health, therapy, or goals that are task related. Although social robots do not need to resemble humans or animals, they often do so in practice (Breazeal et al., 2016, p. 1936). Furthermore, studies show that incorporating anthropomorphic elements such as human-like physical features and social cues like facial expressions, can enhance human acceptance of social robots and produce a sense of social connection (Fink, 2012, p.199-201). However, Fink (2012, p.201) notes that when anthropomorphic design is taken too far, it may have the opposite effect. For instance, a study by Strait et al. (2015, p.3599), found that participants reported being unnerved more frequently in response to robots with high human-likeness.

## 3.2 Conversational Coordination in Social Robots

Turn-taking is a core process in human dialogue, underpinned by turn-constructional units (TCUs) and transitionally relevant places (TRPs). TCU refers to the unit of speech in which one person takes the role of speaker and the other of listener (Skantze, 2021, p. 2). Conversely, a TRP refers to a point in the conversation at which a shift of turns may occur (Skantze, 2021, p. 3).

To coordinate these units, humans use multiple modalities such as verbal cues, prosody, breathing, gestures and eye gaze (Skantze, 2021, p. 2). While people typically manage this complex coordination with rather ease, social robots, by contrast, often struggle to replicate such fluid turn-taking, resulting in interruptions or lengthy pauses that disrupt the conversational flow (Skantze, 2021, p.1)

One approach traditionally used in conversational systems for coordinating turn-taking relies on silence to detect TRPs. However, this approach is not optimal since multiple pauses can be included in one turn (Skantze, 2021, p. 21). Moreover, Skantze (2021, p. 21) proposes that, if the conversational system is embodied, visual cues can help users discern when and by whom the next turn will be taken.

## 3.3 Novelty effect

The term *novelty effect* is used in this paper to describe the initial increase in user engagement, attention, or perceived user experience that may occur when a new feature, technology, or design is introduced. This effect is typically short, lived and tends to diminish as users become familiar with the new element. Since the term lacks a universally agreed, upon definition in the literature, the definition used here is stipulative but grounded in previous studies that describe similar phenomena (Lee et al., 2025, p.3204).

The novelty effect has been observed across several domains. In the context of learning, for example, the introduction of a new technological element often leads to a temporary increase in motivation and interest. Van Den Berghe et al. (2019, p.278) found that learners exhibited higher levels of engagement when interacting with unfamiliar technology, levels that were unlikely to emerge if the learners had prior experience with the same tools. Similarly, Kanda et al. (2004, p.74) reported a decline in children's interactions with robots during the second week of a study, indicating that the novelty of the robot wore off quickly.

This phenomenon is not limited to educational contexts. In the field of user perception, Cho et al. (2019, pp. 1557–1559) investigated how users interact with smart speakers such as Amazon Echo over a 12, week period. The study identified distinct phases in users' evolving expectations and relationships with the technology, beginning with initial enthusiasm that gradually declined as the device became part of everyday life. The researchers reported that users showed a higher degree of tolerance and enthusiasm during the initial phase, driven by the novelty of the device and curiosity about voice interaction (Cho et al., 2019, p.1561). However, the researchers reported that the excitement soon ended and in some cases diminished within a day (Cho et al., 2019, p.1561).

## 3.4 Social presence

Social presence can be defined as "the salience of the interactants and their interpersonal relationship during a mediated conversation", "sense of being with another", or "a co-present entity that appears to be sentient" (Oh et al., 2018, p.2). This feeling intensifies when it is easy to understand another's intelligence, intentions, and sensory experiences, that is, when we can readily tell what they know and think, why they act as they do, and what they are perceiving. Two core concepts in social presence with close relation to each other are intimacy and immediacy. Intimacy in this context refers to the feeling of being connected to one another, which can occur between participants in an interaction. Meanwhile, immediacy refers to "the psychological distance between the communicators". These core concepts are conveyed by the participants of an interaction through both verbal and nonverbal behaviour (Oh et al., 2018, p.2).

Through systemic reviews of existing literature on social presence Oh et al. (2018) identified three broad classes of predictors for social presence. First, immersive qualities, including depth cues (stereoscopy, motion parallax), haptic feedback, enhanced audio quality, and high interactivity, consistently elevate users' sense of "being with" another, establishing an upper bound on social presence (Oh et al., 2018, p.19, 22). Second, contextual properties such as physical proximity or co, presence, identity cues, and the virtual partner's social, psychological attributes further amplify social presence beyond mere technological immersion (Oh et al., 2018, p.22, 24). Furthermore they found that in half of the studies people experienced a higher social presence when they thought there was a real person controlling a virtual human, rather than it being controlled by a computer program (Oh et al., 2018, p.23). The third and final category concerns individual differences, most notably psychological tendencies such as propensity to become immersed in a virtual environment. They found that people with more propensity to immersed in an virtual environment also were more likely to experience a stronger social presence, for example when interacting with a social robot (Oh et al., 2018, p.24).

## 3.5 Interacting with a social robot

Although both chatbots and social robots offer valuable contributions to education, research suggests that social robots outperform chatbots in educational contexts (Cagiltay et al., 2023, p. 1). For instance, one study found that participants had a generally more positive interaction with physically present social robots compared to a virtual agent displayed on a screen (Bainbridge et al., 2011, p.50). Another study showed that positive aspects of using a social robot in education was enhanced interaction, convenience of a spoken conversation rather than a conversation through a chat, and being more interesting where participants said that it gave chat GPT a face (Buchem et al., 2024, p.399). The thought of robots as being more beneficial in education is also supported by Belpaeme et al. (2018, p.1), as they compare physically embodied robots with virtual agents and presents three main differences between the two. The first being that physically embodied robots can be used educational purposes or in populations where an interaction with the physical world is required. The second argument presented by Belpaeme et al., is that users who interact with a physically embodied robots uses more social behaviours that is beneficial for learning. The third and last being that the gains of learning increases (Belpaeme et al., 2018, p.1).

Another study where the participants performed simple tasks involving moving a book where an physical robot either were present or displayed through a live feed in a video, showed that the participants generally had a more positive interaction with a physically present robot than with a non, physically present one (Bainbridge et al., 2011). Further they found that the level of the robots presence affects the types of social interaction that people are prone to engage with, and although the participants showed enjoyment while having interactions with both a robot that was physically present as well as a robot presented through a display. However, there could be made a clear difference between the two since the participants gave the physical robot mote personal space. The results from the study showed that the participants rated the interaction with the physically present robot more positive in regards to the interaction being more natural compared to the interaction with the video displayed robot (Bainbridge et al., 2011, p.51).

However, there are also some negative aspects and limitations of using a social robot that is either not present in chatbots or at least not to the same extent as in a social robot. According to Belpaeme et al. (2018, p. 2) there already are several challenges in using technology in education and by adding a social robot to it will also further add to these challenges. The reason for this is that the social elements that the interaction consists of is hard to automate. Buchem et al. (2024, p.399) found that some of the issues that participants experienced was insufficient audio and a lack of flexibility compared to a typing interface since it is possible to skip text when reading which is not possible in a spoken conversation. Another issue is that social robots to some extent can make people feel uneasy or uncomfortable (Chilufya, 2025, p.112).

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## 3.6 Furhat

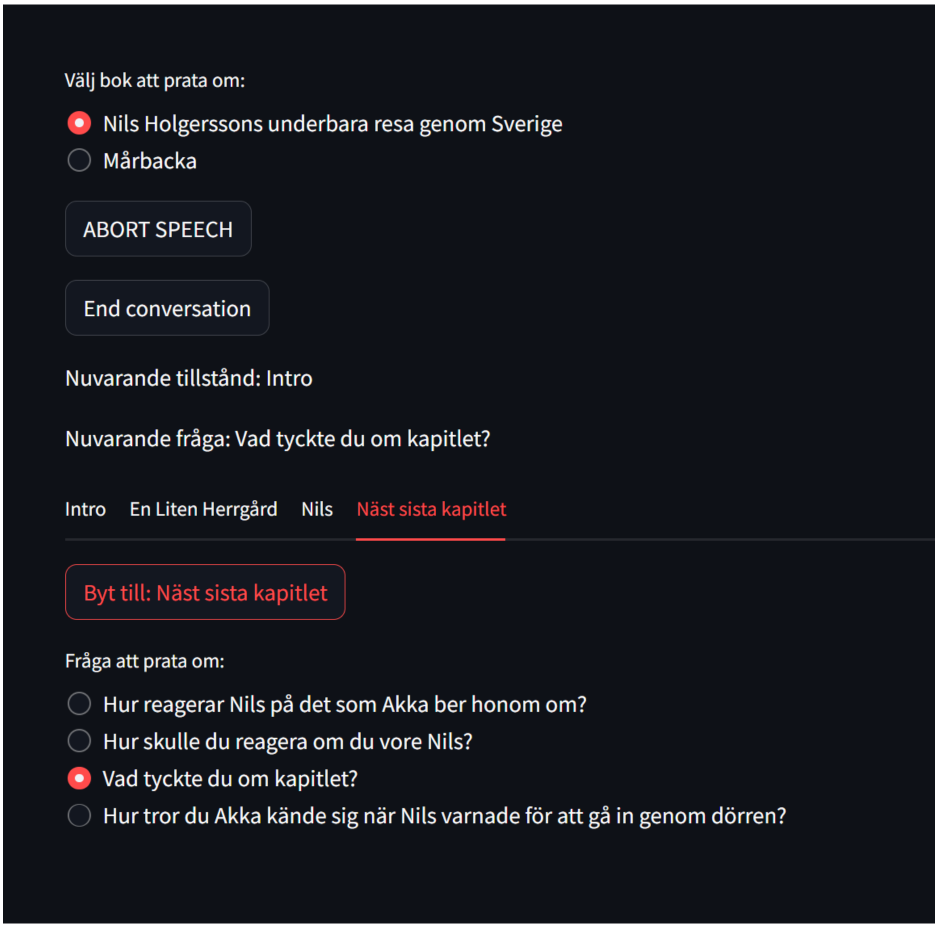
The robot used in this study is called Furhat (Figure 1). Furhat is a human-like robot head equipped with pan, tilt functions and computer animations that is back projected on a mask that then to display a face (Al Moubayed et al., 2012, p.114, 121). The robot uses a multimodal, modular architecture where it combines the facial animations, neck motions, and visual perception with audio processing which enables a natural human-like social interaction (Furhat Robotics, n.d.).

**Figure 1.** Furhat as the social robot interface.

## 3.7 Wizard control interface

The wizard control interface in this study made it possible to manage the conversational context during participant interactions with Bookbot via the Furhat platform. The wizard allows direct control of Furhat through configurable buttons (Furhat Robotics, n.d.). In this implementation, there was four contextual options on which Furhat's next turn would be based. Each option comprised a set of alternative questions that the robot could pose in the subsequent turn. This study made primary use of the contextual option "Näst sista kapitlet" (English translation: "The penultimate chapter"), since this corresponded to the section of the book each participant was reading. The wizard was employed in two scenarios: firstly, to redirect the conversation if the robot vent off-topic; and secondly, to trigger Furhat's end prompt when the interaction time had expired (Figure 2).

**Figure 2.** The Wizard control interface.




## 3.8 Chatbots

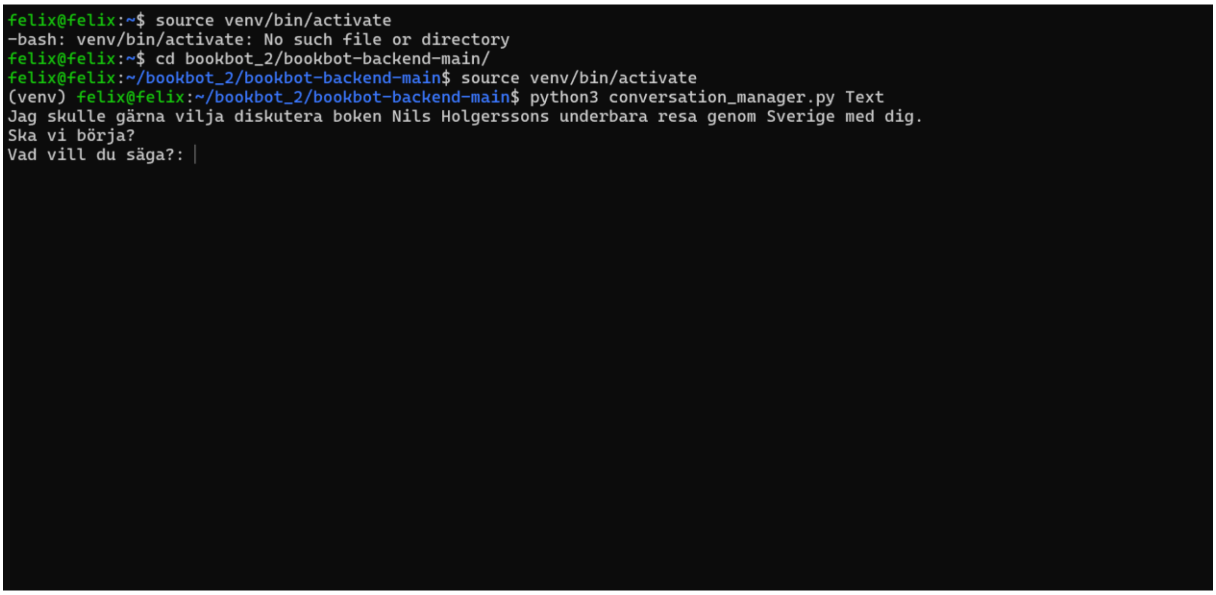
Chatbots are conversational computer programs that process user input and generate appropriate responses (Caldarini et al., 2022, p.1). They have become increasingly popular across many sectors, notably in education, where they support learners by answering subject-related queries and enabling personalised learning pathways (Davar et al., 2025, p.7). Their straightforward, text-based interfaces further enhance intuitiveness compared to more complex applications, and their twenty-four-seven availability ensures that students can access guidance whenever needed (Davar et al., 2025, p.7)

Despite these advantages, current chatbots exhibit important limitations. Although they can offer guidance and automated feedback, they lack the capacity to recognise or respond to human emotions, which may reduce their perceived empathy and effectiveness in sensitive contexts (Davar et al., 2025, p. 14). Even though chatbots can provide users with rapid answers to queries, they still cannot replicate the social and emotional of face-to-face interactions (Samala et al., 2024, p.107).

Furthermore, the widespread adoption of chatbots raises privacy and data-security concerns, as unauthorised access to conversational logs can lead to breaches of personal information. User satisfaction and engagement in human–chatbot interactions are influenced by several factors, including anthropomorphism, communication style, perceived utility, negative emotions and privacy worries which must be carefully balanced in future design iterations (Al-Shafei, 2025, p. 411).

This study used a purely text-based chatbot interface, accessed directly through the terminal of the researcher's computer. The program was launched from the command shell, and participants interacted with the chatbot in real time via the terminal (Figure 3).

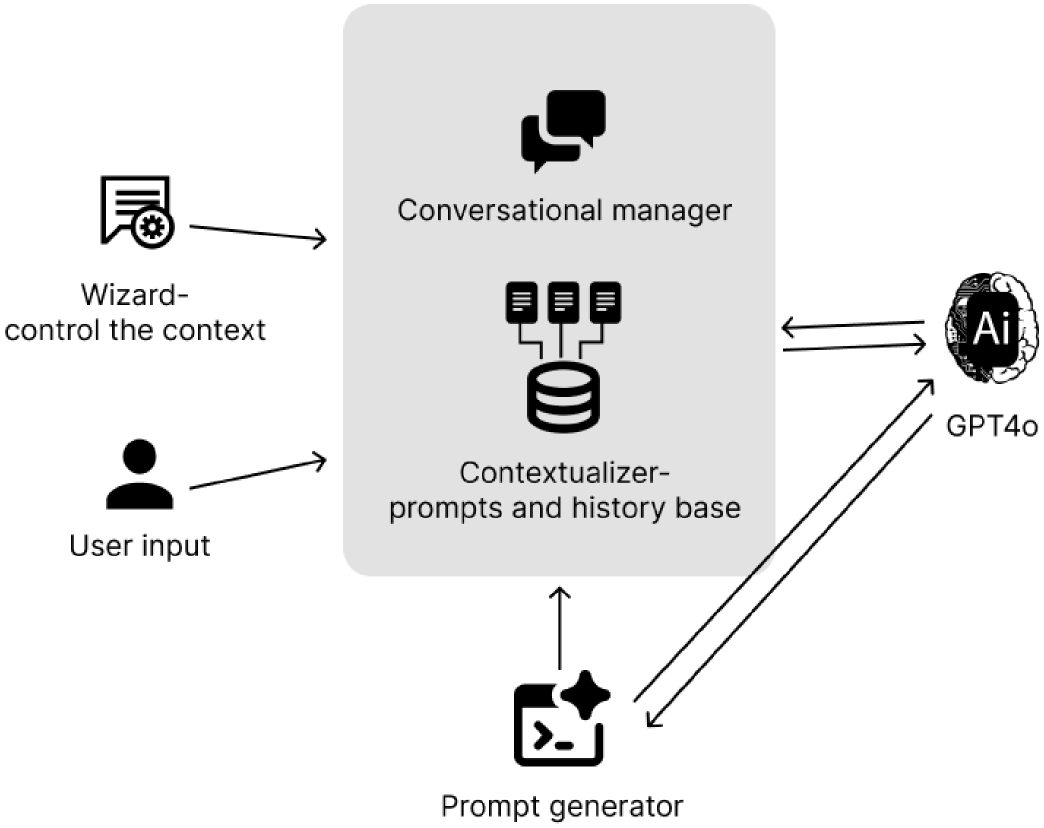
**Figure 3.** The text-based chatbot interface.




## 3.9 Bookbot

Bookbot is a prototype of a conversational agent designed to have book discussions with 10- to 11-year-olds. Figure 4 shows a scaled down illustration the conversation flow used by the system.

**Figure 4.** Illustration of Bookbot's conversational flow.




The user input is first sent to a contextualizer that enriches it using the ongoing conversation history and prepares it for the generator. The original input and the contextualized query are then combined, along with, in BookBot's case, the full conversation history, to form a turn-specific prompt. This prompt is passed to the Large Language Model, whose response is returned, used as output, and appended to the conversation history.

## 3.10 Conversational Design

A prominent design method for chatbots is Conversational Design, which can be defined in terms of tasks that the participant A and B has to perform (Dubberly & Pangaro, 2009, p.23). Dubberly & Pangaro describes these tasks as:

1. Open a channel: A sends an initiative message that opens up the possibility of a conversation. For A's message initiate the conversation, it must establish a common ground between participant B (Dubberly & Pangaro, 2009, p.23).
2. Commit to engage: Participant B must actively decide whether to continue the interaction by assessing the perceived value of the conversation. For the dialogue to persist, the message must be meaningful enough to justify the cognitive and emotional effort required, referred to as the *bio-cost*, which includes the energy, time, attention, and stress involved in maintaining engagement (Dubberly & Pangaro, 2009, p.23).

3. Construct meaning: In conversation, messages are composed of topics or distinctions that rely on commonalities such as shared knowledge between the participants. Participant A uses descriptive dynamics to highlight how certain concepts, ideas, or feelings differ, and prescriptive dynamics to show how these elements connect to form a coherent new idea or concept. These prescriptive elements act like "glue," binding the distinctions into an intelligible whole. Participant B receives the message and processes it in order to make sense of what A is trying to say, or in other words understand the meaning of A's message. When successful, this results in a moment of insight or recognition, a "Aha!" moment. This construct of meaning is possible because of how the descriptive and prescriptive dynamics together forms an inherent coherence for the concept (Dubberly & Pangaro, 2009, p.23).
4. Evolve: After the interaction either A or B, or both, are different in the sense of new beliefs, decision that are being made, or new relationships (Dubberly & Pangaro, 2009, p.23).
5. Converge on agreement: Participant B might be interested in receiving a confirmation by A, that B has in fact understood what A means. For this to happen B must reformulate A's intention with other words at the same time as this reformulation also captures B's model of the concept. It is then participant A that has to make sense of this formulation and compare it with the original intention. If this is successful and the concept match, the participants then have reached an agreement over understanding each other (Dubberly & Pangaro, 2009, p.24).
6. Act or transact: Participants sometimes after this agree to take further action or make exchanges based on their conversation, such as agreeing to play a game or making a purchase (Dubberly & Pangaro, 2009, p.24).

# 4. Method

## 4.1 Research Design

This study employed a mixed-methods design combining both quantitative and qualitative data to gain a comprehensive understanding of how users experience and interact with two different interfaces: a chatbot and a social robot. The study aimed to evaluate differences in user experience, identify usability issues, and explore how socially engaging aspects of robot interaction could be transferred to a text, based chatbot system.
Quantitative data were collected using the User Experience Questionnaire (UEQ), while qualitative insights were gathered through thematic analysis of semi structured interviews.

## 4.2 Participants

A convenience sample of ten (N = 10) university students was used for two pragmatic reasons. First, as a student-researcher I had direct, ethical access to peers on campus, which ensured rapid recruitment and scheduling within the limited timeframe. Second, the study's exploratory aim, to identify broad usability patterns and user-experience contrasts between a social-robot and a chatbot interface—could be addressed with a small, homogenous cohort, making intensive mixed-methods data collection (observation, UEQ, interviews) feasible without exceeding available time and resources. Although this sampling strategy limits generalisability, it provides a practical first step in which its findings can be used in larger, more diverse studies in future work.
Informed consent was obtained prior to participation, and participants were informed about their right to withdraw at any time (see appendix).

## 4.3 Data Collection

This study employed a mixed-methods design, combining quantitative and qualitative approaches to capture both measurable UX differences and in-depth user perspectives.

### 4.3.1 User Experience Questionnaire

Participants' subjective experience of each interface was measured using the standardized UEQ (Schrepp, 2023). The UEQ assesses six scales—Attractiveness, Perspicuity, Efficiency, Dependability (pragmatic qualities), and Stimulation, Novelty (hedonic qualities)—via semantic differential items (e.g. "confusing – clear") on a 7-point Likert scale ranging from –3 to +3. The Attractiveness dimension comprises six items; all other scales include four items each (Schrepp, 2023, pp. 2–3). The UEQ was administered immediately after each interaction to reduce retrospective bias (Schrepp, 2023, p. 8), resulting in two sets of responses per participant, one for the chatbot and one for the robot.

### 4.3.2 Semi-structured Interviews

After completing both interactions, participants were asked semi, structured follow, up questions about their experience. These interviews aimed to elicit qualitative reflections on ease of use, engagement, and the perceived "personality" of the system. Interviews were transcribed verbatim and used as input for thematic analysis.

## 4.4 Procedure

Each session began with the participant signing two identical consent forms, one copy for the participant to keep and one for the researcher. Additional to this they also got to fill in their age, gender and if they have used/prior experience of a chatbot or a robot. any This was followed by a brief overview of the session procedure and what the participant could expect. Participants were then asked to read the second, to, last chapter of the Swedish children's book *Nils Holgerssons underbara resa genom Sverige* (*Lagerlöf*, 1906/2023). To avoid

creating a stressful or pressured environment, the researcher left the room while the participant was reading. This was done to ensure that participants could read at their own pace without feeling observed.
Each participant interacted with two different interfaces connected to the Bookbot system: a text, based chatbot and a social robot (Furhat). The order of interactions was counterbalanced to minimize potential order effects.
After each interaction, participants were first asked to complete the User Experience Questionnaire (UEQ) in order to capture their immediate impressions and subjective experience of the interface while the interaction was still fresh in mind (see Appendix). Following the completion of the UEQ after each interaction, a semi, structured interview was conducted for each interface. These interviews aimed to gather qualitative insights into the participants' subjective experiences, focusing on perceived usability, clarity, engagement, and any moments of uncertainty during the interaction. Each participant responded to the same set of open, ended questions after using both the chatbot and the robot interface:

- How did you experience the interaction with the chatbot/robot?
- Were there any moments during the interaction when you felt unsure about what to do?
- How engaged did you feel during the interaction? Was there anything in particular that made you feel more or less engaged?
- Do you have anything else you would like to add?

In total, each participant answered these four questions twice, once for each interface. In addition, at the end of the second (final) interview, participants were asked a comparative question intended to capture overarching reflections:

- Did you experience any difference in interacting with the chatbot versus the robot?

## 4.5 Data Analysis

### 4.5.1 User Experience Questionnaire

Descriptive statistics were computed for each of the UEQ's six dimensions. 95% confidence intervals were calculated to estimate the range of likely values for each mean. In addition, independent, samples t, tests were conducted to assess whether there were statistically significant differences in user experience between the two interfaces ($p < .05$).

### 4.5.2 Thematic Analysis

A reflexive thematic analysis approach was used to analyse interview transcripts (Braun & Clarke, 2006). This method involves a six, phase process: familiarization with the data, initial coding, theme generation, theme review, theme definition, and report writing. An inductive approach was used, allowing themes to emerge from the data rather than being pre-defined.

## 4.6 Ethical Considerations

Participants were given written and verbal information about the study purpose, data use, and confidentiality. All data were anonymized. The study did not collect sensitive personal information and was conducted in accordance with the ethical guidelines of the Swedish Research Council (*God forskningssed*, Vetenskapsrådet, 2017).

# 5. Results

Out of all the participants all have had experience in using a chatbot prior to the test while only three had an experience with a robot prior to the test.

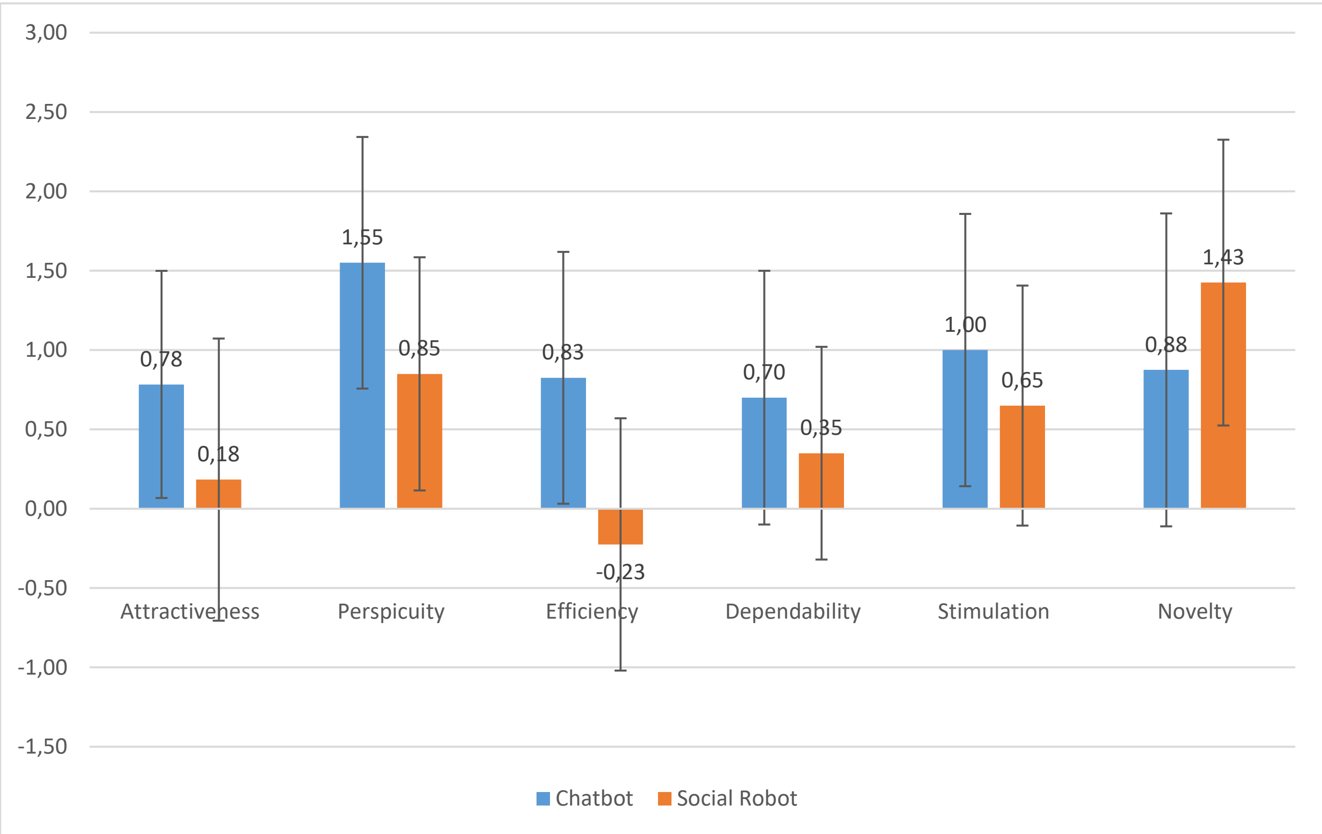
## 5.1 User Experience Questionnaire

For each dimension of the User Experience Questionnaire (UEQ), 95 % confidence intervals (CIs) were calculated to estimate the range within which the true mean scores are likely to fall for the two Bookbot interaction types, text-based chatbot and embodied Furhat robot. Because the sample was small (N = 10), the CIs were generally wide, especially for the robot, signalling a high degree of statistical uncertainty (see Table 1).

**Table 1.** Scale means and the corresponding 5% confidence intervals.

| | Chatbot | | | | | | Social Robot | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scale | Mean | STD | N | Confidence | Confidence Interval | | Mean | STD | N | Confidence | Confidence Interval | |
| Attractiveness | 0,78 | 1,15 | 10 | 0,72 | 0,07 | 1,50 | 0,18 | 1,43 | 10 | 0,89 | -0,71 | 1,07 |
| Perspicuity | 1,55 | 1,28 | 10 | 0,79 | 0,76 | 2,34 | 0,85 | 1,19 | 10 | 0,73 | 0,12 | 1,58 |
| Efficiency | 0,83 | 1,28 | 10 | 0,79 | 0,03 | 1,62 | -0,23 | 1,28 | 10 | 0,79 | -1,02 | 0,57 |
| Dependability | 0,70 | 1,29 | 10 | 0,80 | -0,10 | 1,50 | 0,35 | 1,08 | 10 | 0,67 | -0,32 | 1,02 |
| Stimulation | 1,00 | 1,38 | 10 | 0,86 | 0,14 | 1,86 | 0,65 | 1,22 | 10 | 0,76 | -0,11 | 1,41 |
| Novelty | 0,88 | 1,59 | 10 | 0,99 | -0,11 | 1,86 | 1,43 | 1,45 | 10 | 0,90 | 0,52 | 2,33 |

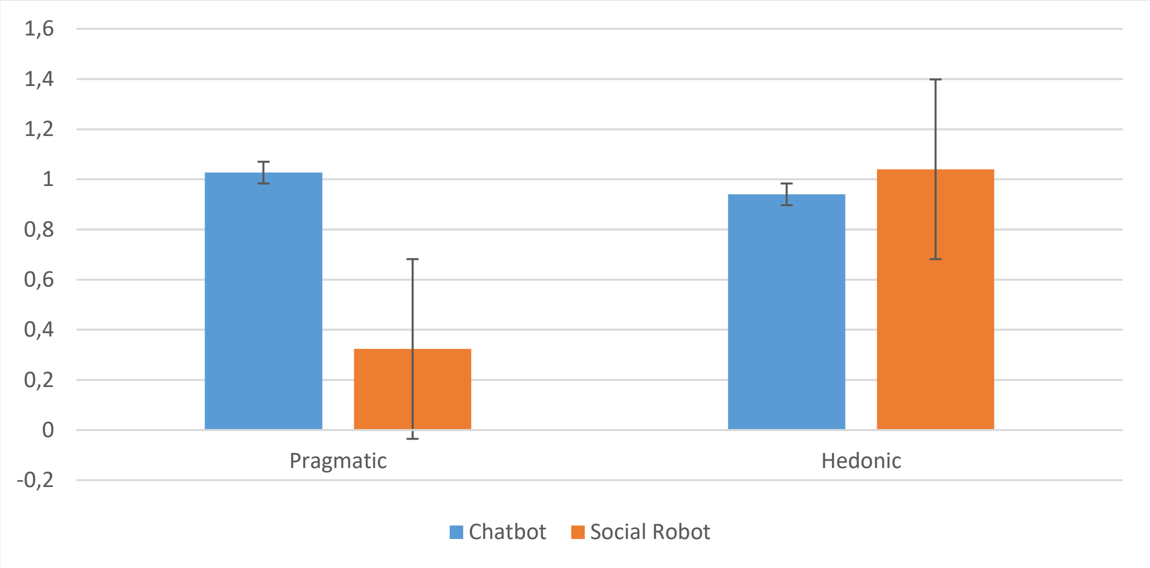
**Figure 5.** Mean values (±SD) for the UEQ scales.




However, the results for the hedonic quality dimensions were more mixed: the chatbot interface scored higher on stimulation, while the robot interface was rated higher in terms of novelty, indicating that neither interface outperformed the other across all user experience aspects (see Figure 5).

Visual inspection nevertheless revealed some consistent patterns. On the pragmatic, quality scales (Perspicuity, Efficiency and Dependability) the chatbot tended to display higher mean values, and its narrower CIs suggest more uniform user responses. Conversely, the robot produced higher mean values on the hedonic, quality scales (Stimulation and Novelty), although its broader CIs indicate less consistent evaluations (see Figure 6). Crucially, the CIs for both interfaces overlapped across every UEQ dimension, pragmatic, hedonic and overall attractiveness, indicating that none of the observed mean differences reach statistical significance.

**Figure 6.** Pragmatic and Hedonic Qualities.




These descriptive findings are fully in line with the inferential statistics: independent two, sample t, tests detected no significant differences between the chatbot and the social, robot conditions on any UEQ scale (all $p > 0.05$). Taken together, the evidence suggests that, within the limits of the present data set, neither interface delivers a measurably superior user experience.

## 5.2 Thematic analysis

### 5.2.1 Theme 1: Clarity and Comprehension in Communication

This theme captures participants' experiences of how understandable the communication was across both interfaces. Participants consistently expressed that the robot interface was more difficult to comprehend, primarily due to its speech delivery:

- *"It went a little too fast at the end of some of the questions... it was a little too fast and choppy with the words, there was no space between."* (Participant 3)
- *"It was a bit difficult to understand what it was saying... the stress on words and stuff came out weird... it took away a bit from the conversation."* (Participant 10)

In contrast, the chatbot's text, based format made comprehension easier:

- *"I think it's easier to read the answers myself than to have someone tell them to me."* (Participant 10)
- *"The chatbot made it easier to perceive the question, since you could see it written down."* (Participant 6)

- *“It was very straightforward. It asked a clear question, and once you answered, it moved on.”* (Participant 9)

However, some participants noted that despite the clarity, the chatbot sometimes failed to interpret their responses correctly:

- *“It didn’t know what I was talking about... it felt very locked... I answered, but it misinterpreted me.”* (Participant 4)

These insights suggest that while the chatbot offered clearer initial communication, its ability to adapt to nuanced input was limited. The robot, in contrast, sounded more natural in tone but lacked clarity in delivery.

#### 5.2.2 Theme 2: Turn-Taking and Conversational Flow

This theme reflects how participants experienced control over pacing and turn, taking in their interactions. The robot often interrupted participants or responded unexpectedly, which disrupted the flow of conversation:

*“Above all, it felt like you didn't get to talk to the point sometimes before it interrupted.”* (Participant 8)

*“It sometimes interrupted me because it had processed what I was saying and then responded before I was actually done.”* (Participant 2)

These interruptions caused frustration and decreased engagement:

*“It became a little less engaging when it interrupted you... it felt like you didn’t really get through what you wanted to say.”* (Participant 8)

One participant adapted to this by modifying the speaking patterns:

*“I started taking slightly longer pauses to let it process... then it turned out that it responded after a little while.”* (Participant 2)

Longer response delays from the robot during the interaction in some cases resulted in uncertainty:

*“Sometimes when I thought I had finished talking, it was silent for a very long time... then I became a little insecure.”* (Participant 1)

*“Should I repeat myself? Did it hear me? Should I give a better answer? Perhaps I didn’t speak clear enough…”* (Participant 5)

In contrast, the chatbot allowed participants to control the pace:

*“I could just sit and write as long as I wanted, and then click enter... I knew it was waiting for me to finish.”* (Participant 2)

*“With the chatbot, you have more time to think about exactly how you want to ask the question without being interrupted.”* (Participant 8)

The asynchronous nature of text gave users a stronger sense of control and reduced pressure. As one participant noted it made it easier to stay focused on the task at hand:
*"It was easier for me to not drift off in the same way... a bit easier to stay focused"* (Participant 5).

### 5.2.3 Theme 3: Perceived Social Presence and Human-Likeness

This theme explores how social presence and human-like features shaped participants' perceptions of the robot. According to Oh et al. (2018, p.2) social presence refers to "salience of the interactants and their interpersonal relationship during a mediated conversation". The robot's face was often perceived as a positive factor contributing to a stronger social presence:

> *"I guess the robot is more personal. It was kind of cozier that way... I liked having a face in front of me."* (Participant 5)
>
> *"The biggest difference is that it has a face... it clicks something in the brain... the conversation feels more meaningful."* (Participant 3)
>
> *"It becomes a little more real."* (Participant 8)

Participants also described the robot's voice as both engaging and problematic. One participant appreciated the natural intonation despite its synthetic quality:

> *"I thought the voice took away from the experience because it felt a bit like AI generated... but it still felt like I was actually having a conversation."* (Participant 1)

However, for others, the voice produced discomfort:

> *"I was very shocked by the voice actually. I wasn't prepared for it to be a child."* (Participant 6)
>
> *"It felt a bit stressful... I don't know, it felt like, it was harder to remember what I had read… I was put on the spot in some way I think."* (Participant 6)

Overall, the robot's human-like attributes elicited stronger emotional reactions, both positive and negative. The chatbot, lacking these embodied cues, was experienced as less engaging and less socially present, but also less stressful and more predictable.

# 6. Discussion

Although the User Experience Questionnaire (UEQ) showed no statistically significant differences between the interfaces, descriptive results pointed to meaningful tendencies. The chatbot was rated higher on pragmatic dimensions such as perspicuity, efficiency, and dependability, as well as on overall attractiveness. In contrast, the robot interface was rated more highly in terms of novelty, while stimulation was slightly higher for the chatbot. These tendencies reflect the contrast between a more functionally stable system and one that, while socially richer, presented more unpredictable interaction patterns.
From the thematic analysis three central aspects of the user experience emerged as participants switched between the chatbot and robot interfaces: (1) The clarity of communication differed, in that the chatbots text-based format was perceived as clear and easy to follow even though it on some occasions had some challenges in interpreting users' responses. The robot's speech in contrast was by some participants perceived as more natural but still faced some challenges in the way that the speech was delivered. Participants expressed that it felt like the robot sometimes spoke to fast or increased the speed towards the end of a sentence or in places where it didn't make sense. Furthermore, some participants felt like the robots' speech was unclear and thus not fully comprehensible. (2) The flow of conversation was strongly influenced by each interface's handling of turn taking and pacing. While the chatbots asynchronous design reduced stress and gave users complete control over tempo, the robot frequently interrupted or delayed its replies, leading to frustration and uncertainty. However, one participant admitted to making adjustments during the interaction to better match the pace of the robot's conversational flow. These results mirrors prior research (Skantze, 2021, pp.1-2) were conversational systems tend to struggle with turn-taking resulting in frequent interruptions and long response delays. (3) Finally, the robots

face and voice created a sense of social presence, where its human-like features in some cases enhanced engagement thus making the conversation feel more personal and meaningful. This could be translated to the users perceiving the robot as having a stronger social presence relating to prior literature (Bainbridge et al., 2011, p. 51; Fink, 2012, pp. 199-201). The same, however, could not be said of the chatbot, which despite providing rapid answers to queries still could not replicate the social and emotional nuances of face-to-face interactions, mirroring previous studies in the literature (Samala et al., 2024, p.107).
These observations also reveal usability issues that directly hinder the core conversational tasks (Dubberly & Pangaro, 2009, pp. 23–24). For example, Task 2, “Commit to engage,” requires participants to judge the value of continuing a dialogue, a process rendered difficult if they cannot comprehend the robot’s speech (due to speed or tonal inconsistencies). However, the chatbot also exhibits problems that hinders tasks: if it misinterprets a user’s meaning, Tasks 2 (“Commit to engage”), 3 (“Construct meaning”) and 5 (“Converge on agreement”) all break down, since each depends on mutual understanding between A and B (Dubberly & Pangaro, 2009, pp. 23-24). Addressing these issues should therefore be considered a major usability priority, since they not only disrupt understanding but also threaten users’ willingness to remain engaged.

## 6.1 Contributions to the field

This study makes several key contributions. It provides rare, directly comparable empirical data on social robot versus chatbot interfaces in terms of both usability (RQ 1a) and user experience (RQ 1b), addressing a gap left by earlier work, which has often treated each interface in isolation or offered one-sided comparisons.

## 6.2 Design implications

Based on the findings the thematic analyses and the UEQ, three concrete guidelines for conversational interface design. First, because of the social robots human-like attributes which elicited a stronger social presence, the chatbot should make use of this and add a minimalist avatar with some basic expressions which might create a stronger social presence (see Table 2). Furthermore, both the chatbot interface and the social robot interface could add the possibility, with the user’s consent, to address the user by name since it would likewise build on social presence.
Although these usability issues are more pronounced with the social robot, both systems should incorporate simple status indicators to prevent premature interruptions and reduce uncertainty during long response delays (Table 2). For the chatbot, such an indicator would merely inform the user that the system is processing their message.
Lastly, to improve the clarity of speech the social robot could make use of something such as a “speech rate control” which adjusts the speed of which the robot talks. This would encourage users to adjust the speech speed to their preferred needs (Table 2).

**Table 2.** Design guidelines for the interfaces.

| Goal | Implication | Reason |
|---|---|---|
| Enhanced social presence | - **Chatbot**: Add a minimalist avatar with three expressions (smile, nod, blink)<br>- **Chatbot and robot**: Address user by name and use emojis | - **Chatbot:** Introduce anthropomorphic attributes build a stronger social presence (But don't overdo it)<br>- **Chatbot and robot:** Builds social presence personal rapport and reduces perceived distance. |
| Indicate system status | - **Chatbot and robot:** Use eyebrow raise or gentle chime to signal "listening" and "ready for input". | - **Chatbot and robot:** In the case of the robot this prevents premature interruptions and uncertainty due to long response delays. For the chatbot this simply acts as an indication that it processes something or not. |
| Improve clarity of communication | - **Robot:** Provide adjustable speech rate controls. | - **Robot**: Encourages users to match speech rate to their specific needs. |

## 6.3 Limitations

There are several things that needs to be taken into account when interpreting the results of this study. Since most participants had no previous experience interacting with a social robot, it's possible that some reactions were influenced by the novelty effect, the idea that something new can seem more exciting just because it's unfamiliar. It's also important to remember that Bookbot was used in both conditions and is still a prototype. This means the results reflect the current version of Bookbot, rather than the overall potential of chatbot or robot interfaces in general. While some results may suggest that the chatbot worked better in terms of user experience, this likely says more about the chatbot prototype than about chatbots as a concept being better than social robots.

Another limitation has to do with the content and target group. The reading task was originally designed for 11, year, olds, but the participants in this study were university students. Using literature that better matches the age and interests of the participants could improve engagement in future studies. The robot's timing when responding was also mentioned by several participants as some felt it didn't listen properly or interrupted them. Thus, this is something future versions of Bookbot should work on.

Since the wizard control interface made it possible to steer the context of the conversation, future studies should make sure to develop well defined guidelines of when the researcher should apply it or not. This is in order to prevent participants from feeling ignored, since its current implementation may cause the robot to sidestep the users questions by introducing off-topic prompts to steer the dialogue back to the book-discussion.

Gender was not taken into account when recruiting participants, and it's possible that gender could affect how people respond to these types of interfaces. This wasn't explored in this study. However, in future research it could be important to consider having a more even spread of gender amongst the participants.

Furthermore, future research should recruit a larger sample to satisfy the UEQ benchmark. Although 20–30 participants typically yield stable results (Schrepp, n.d., p. 15), study included only ten participants, which may have compromised the stability of its UEQ scores compared to what could be achieved had the recommended sample size been reached. Finally, even though the order of the two interactions was varied between participants to avoid bias, there was no analysis of whether it mattered which interface was used first. It's possible that using the robot or chatbot first may have shaped expectations or influenced the way the second interaction was experienced. This is something that future studies could look into more closely. All of these factors, along with the small sample size, mean that the results should be seen as exploratory rather than definitive.

## 6.4 Future research

Since this study only made use of the terminal for the text based chatbot, further studies should make use of a more complete graphical user interface for a chatbot since having a visual representation of a basic chatbot graphical user interface may impact the results. Future studies aiming to implement the design implications recommended here should employ an issue-based metric, since these aspects have not been the focus of investigation in this study, thereby enabling a systematic evaluation and prioritisation of specific usability and experiential concerns. Furthermore, future studies should incorporate both an introductory familiarisation period and a dedicated measure of social presence in order to disentangle initial novelty from enduring engagement. By allowing participants time to familiarise themselves with the system before data collection, researchers can mitigate the novelty effect without unduly compromising interaction quality even though users will inevitably become somewhat accustomed to interacting with the robot. More importantly, supplementing thematic analysis and UEQ data with a validated method of measuring social presence would enable a direct, quantitative assessment of how strongly users perceive the robot or chatbot as a co-present entity that appears to be sentient (Oh et al., 2018, p.2). Administering this measure at multiple time points further allows investigators to track the trajectory of social presence, thus separating the short-lived thrill of something new with long-term engagement.

# 7. Conclusion

In summary, this study has demonstrated that, although chatbots and social robots each offer valuable affordances for educational book-discussion tasks, they do so in complementary ways rather than in direct competition. Quantitative data from the UEQ suggest that the text-based chatbot tended to score higher than the embodied robot on pragmatic dimensions: perspicuity, efficiency and dependability. Meanwhile the robot scored more highly on novelty, which could be reflected more or less directly on the fact that the vast majority of participants experienced a social robot for the first time during this study. Qualitative insights further showed that participants valued the chatbot's clarity and predictable pacing yet found the robot's human-like voice and facial presence more engaging and emotionally resonant, despite occasional interruptions and comprehension issues.

These findings contribute to the field by providing directly comparable mixed-methods evidence on user experience across two conversational modalities, and by highlighting the specific interaction challenges such as turn-taking breakdowns and speech delivery, that must be addressed to harness the best of both worlds. Designers should consider integrating minimalist social cues into chatbots to bolster presence, while equipping robots with adaptive speech controls and robust turn-management mechanisms. Future work would benefit from deploying issue-based metrics and validated social-presence scales over extended sessions, to mitigate the novelty effects from enduring engagement.

Overall, this study advances the current understanding of conversational interface design by revealing how stability and social presence trade off and by showing how they can be integrated in future systems.

## 8. References

DAl Moubayed, S., Beskow, J., Skantze, G., & Granström, B. (2012). Furhat: A Back-Projected Human-Like Robot Head for Multiparty Human-Machine Interaction. In A. Esposito, A. M. Esposito, A. Vinciarelli, R. Hoffmann, & V. C. Müller (Eds.), *Cognitive Behavioural Systems* (Vol. 7403, pp. 114–130). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-34584-5_9

Al-Shafei, M. (2025). Navigating Human-Chatbot Interactions: An Investigation into Factors Influencing User Satisfaction and Engagement. *International Journal of Human–Computer Interaction*, *41*(1), 411–428. https://doi.org/10.1080/10447318.2023.2301252

Bainbridge, W. A., Hart, J. W., Kim, E. S., & Scassellati, B. (2011a). The Benefits of Interactions with Physically Present Robots over Video-Displayed Agents. *International Journal of Social Robotics*, *3*(1), 41–52. https://doi.org/10.1007/s12369-010-0082-7

Bainbridge, W. A., Hart, J. W., Kim, E. S., & Scassellati, B. (2011b). The Benefits of Interactions with Physically Present Robots over Video-Displayed Agents. *International Journal of Social Robotics*, *3*(1), 41–52. https://doi.org/10.1007/s12369-010-0082-7

Belpaeme, T., Kennedy, J., Ramachandran, A., Scassellati, B., & Tanaka, F. (2018). Social robots for education: A review. *Science Robotics*, *3*(21), eaat5954. https://doi.org/10.1126/scirobotics.aat5954

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Breazeal, C., Dautenhahn, K., & Kanda, T. (2016). Social Robotics. In *Springer Handbook of Robotics* (Vol. 2016, p. 2259). Springer.

Buchem, I., Bonga, G. A. K., & Tutul, R. (2024). From Screens to AI-Driven Human-Robot Interaction: Comparing Students' Perceptions of the Robots Pepper and Furhat for ChatGPT-Based Exam Preparation. In R. Balogh, D. Obdržálek, & M. Fislake (Eds.), *Robotics in Education* (Vol. 1084, pp. 391–402). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-67059-6_34

Cagiltay, B., Mutlu, B., & Michaelis, J. E. (2023). "My Unconditional Homework Buddy:" Exploring Children's Preferences for a Homework Companion Robot. *Proceedings of the 22nd Annual ACM Interaction Design and Children Conference*, 375–387. https://doi.org/10.1145/3585088.3589388

Caldarini, G., Jaf, S., & McGarry, K. (2022). A Literature Survey of Recent Advances in Chatbots. *Information*, *13*(1), 41. https://doi.org/10.3390/info13010041

Chilufya, E. M., Severinsson, S., Bylund, M., Stenliden, L., Mortazavi, A., & Ziemke, T. (n.d.). *The BookBot Project: Conceptual Design of a Social Robot Facilitating Reading Motivation.*

Cho, M., Lee, S., & Lee, K.-P. (2019). Once a Kind Friend is Now a Thing: Understanding How Conversational Agents at Home are Forgotten. *Proceedings of the 2019 on Designing Interactive Systems Conference*, 1557–1569. https://doi.org/10.1145/3322276.3322332

Davar, N. F., Dewan, M. A. A., & Zhang, X. (2025). AI Chatbots in Education: Challenges and Opportunities. *Information*, *16*(3), 235. https://doi.org/10.3390/info16030235

Dubberly, H., & Pangaro, P. (2009). ON MODELINGWhat is conversation, and how can we design for it? *Interactions*, *16*(4), 22–28. https://doi.org/10.1145/1551986.1551991

Fink, J. (2012). Anthropomorphism and Human Likeness in the Design of Robots and Human-Robot Interaction. In S. S. Ge, O. Khatib, J.-J. Cabibihan, R. Simmons, & M.-A. Williams (Eds.), *Social Robotics* (Vol. 7621, pp. 199–208). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-34103-8_20

*God forskningssed* (Reviderad utgåva). (2017). [Elektronisk resurs]. Vetenskapsrådet.

Kanda, T., Hirano, T., Eaton, D., & Ishiguro, H. (2004). Interactive Robots as Social Partners and Peer Tutors for Children: A Field Trial. *Human-Computer Interaction*, *19*(1), 61–84. https://doi.org/10.1207/s15327051hci1901&2_4

Lee, J., Chen, C. C., & Basu, A. (2025). From Novelty to Knowledge: A Longitudinal Investigation of the Novelty Effect on Learning Outcomes in Virtual Reality. *IEEE Transactions on Visualization and Computer Graphics*, *31*(5), 3204–3212. https://doi.org/10.1109/TVCG.2025.3549897

Oh, C. S., Bailenson, J. N., & Welch, G. F. (2018). A Systematic Review of Social Presence: Definition, Antecedents, and Implications. *Frontiers in Robotics and AI*, *5*, 114. https://doi.org/10.3389/frobt.2018.00114

Samala, A. D., Zhai, X., Aoki, K., Bojic, L., & Zikic, S. (2024). An In-Depth Review of ChatGPT's Pros and Cons for Learning and Teaching in Education. *International Journal of Interactive Mobile Technologies (iJIM)*, *18*(02), 96–117. https://doi.org/10.3991/ijim.v18i02.46509

Schrepp, D. M. (n.d.). *User Experience Questionnaire Handbook*.

Shourmasti, E. S., Colomo-Palacios, R., Holone, H., & Demi, S. (2021). User Experience in Social Robots. *Sensors*, *21*(15), 5052. https://doi.org/10.3390/s21155052

Skantze, G. (2021). Turn-taking in Conversational Systems and Human-Robot Interaction: A Review. *Computer Speech & Language*, *67*, 101178. https://doi.org/10.1016/j.csl.2020.101178

Strait, M., Vujovic, L., Floerke, V., Scheutz, M., & Urry, H. (2015). Too Much Humanness for Human-Robot Interaction: Exposure to Highly Humanlike Robots Elicits Aversive Responding in Observers. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 3593–3602. https://doi.org/10.1145/2702123.2702415

Van Den Berghe, R., Verhagen, J., Oudgenoeg-Paz, O., Van Der Ven, S., & Leseman, P. (2019). Social Robots for Language Learning: A Review. *Review of Educational Research*, *89*(2), 259–295. https://doi.org/10.3102/0034654318821286

# 9. Appendix

## 9.1 Prompts

### 9.1.1 ConversationPrompt

```
Använd följande kontext för att svara på frågan. Om du inte vet
svaret, säg det. Hitta aldrig på ett svar.
[kontext, rader infogas här, separerade med radbrytningar]
Fråga: [användarens fråga].
Svara på svenska
```

### 9.1.2 ContextualizingPrompt

```
Baserat på chathistorik och den senaste användarfrågan som kan
referera till sammanhang i chathistoriken, formulera en fristående
fråga som kan förstås utan chathistoriken.
Men du behöver inte nämna bokens titel eller författare.
Svara INTE på frågan, reformulera den bara om det behövs och
returnera den annars som den är.
Om användarfrågan handlar om en person, ämne eller sak måste du
förklara vad det är som avses.
Historiken är: [formaterad chathistorik]
Användarens fråga är: [användarens fråga].
Svara på svenska
```

### 9.1.3 BotContinuedQuestionPrompt

```
Du kommer få en fråga som du ska prata om med en student. Du kommer
också få tidigare historik som du kan använda för att ställa
följdfrågor på svaret du får. Du kommer också få en del kontext från
boken som du kan använda om du behöver, men det är inget krav.
Försök dock hålla samtalet till innehåll i boken i första hand.
' ' ' '
Historiken är: [formaterad chathistorik]
' ' ' '
Kontexten är: [kontextlista]
' ' ' '
Frågan som ni ska behandla är: [aktuell fråga].
' ' '
Det som användaren säger är: [användarens fråga]. Svara på svenska.
Det viktigaste att du för ett samtal med användaren och hela tiden
ställer en följdfråga på det användaren säger. Försök att bara
ställa en följdfråga, inte flera.
```

### 9.1.4 BotContinuedQuestionPrompt

```
Du kommer få en fråga som du ska prata om med en student. Du kommer
också få tidigare historik som du kan använda. Du kommer också få en
del kontext från böckerna som du kan använda om du behöver, men det
är inget krav. Du ska svara på det användaren sa, och sedan styra
samtalet till den nya frågan du får. Denna ska du ställa till
användaren. Försök hålla samtalet till innehåll i boken i första
hand, men hitta inte på saker.
' ' ' '
Historiken är: [formaterad chathistorik]
' ' ' '
```

Kontexten är: [kontextlista]
' ' ' '
Frågan som ni ska behandla är: [aktuell fråga].
' ' '
Det som användaren säger är: [användarens fråga]. Svara på svenska. Försök koppla den nya frågan till det användaren sa. Om användaren inte sa något, ställ bara frågan.

### 9.1.5 IntroPrompt

Du kommer få en fråga som du ska prata om med en student. Du kommer också få tidigare historik som du kan använda. Syftet är att introducera studenten till ett samtal om böcker och ni ska lära känna varandra.
Det som användaren säger är: [användarens fråga]
' ' ' '
Frågan ni ska prata om är: [aktuell fråga].
Svara på svenska. Det viktigaste att du för ett samtal med användaren och hela tiden ställer en följdfråga på det användaren säger. Försök att inte upprepa följdfrågor.

### 9.1.6 EndPrompt

Du har precis haft ett trevligt samtal om böcker med en student. Du ska nu göra ett trevligt avslut på samtalet där du önskar studenten lycka till och hoppas att det läser många fler böcker i framtiden.

## 9.2 User Experience Questionnaire (UEQ)

**Please make your evaluation now.**

For the assessment of the product, please fill out the following questionnaire. The questionnaire consists of pairs of contrasting attributes that may apply to the product. The circles between the attributes represent gradations between the opposites. You can express your agreement with the attributes by ticking the circle that most closely reflects your impression.

Example:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| attractive | ○ | ⊗ | ○ | ○ | ○ | ○ | ○ | unattractive |

This response would mean that you rate the application as more attractive than unattractive.

Please decide spontaneously. Don't think too long about your decision to make sure that you convey your original impression.

Sometimes you may not be completely sure about your agreement with a particular attribute or you may find that the attribute does not apply completely to the particular product. Nevertheless, please tick a circle in every line.

It is your personal opinion that counts. Please remember: there is no wrong or right answer!

Please assess the product now by ticking one circle per line.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
|---|---|---|---|---|---|---|---|---|---|
| annoying | ○ | ○ | ○ | ○ | ○ | ○ | ○ | enjoyable | 1 |
| not understandable | ○ | ○ | ○ | ○ | ○ | ○ | ○ | understandable | 2 |
| creative | ○ | ○ | ○ | ○ | ○ | ○ | ○ | dull | 3 |
| easy to learn | ○ | ○ | ○ | ○ | ○ | ○ | ○ | difficult to learn | 4 |
| valuable | ○ | ○ | ○ | ○ | ○ | ○ | ○ | inferior | 5 |
| boring | ○ | ○ | ○ | ○ | ○ | ○ | ○ | exciting | 6 |
| not interesting | ○ | ○ | ○ | ○ | ○ | ○ | ○ | interesting | 7 |
| unpredictable | ○ | ○ | ○ | ○ | ○ | ○ | ○ | predictable | 8 |
| fast | ○ | ○ | ○ | ○ | ○ | ○ | ○ | slow | 9 |
| inventive | ○ | ○ | ○ | ○ | ○ | ○ | ○ | conventional | 10 |
| obstructive | ○ | ○ | ○ | ○ | ○ | ○ | ○ | supportive | 11 |
| good | ○ | ○ | ○ | ○ | ○ | ○ | ○ | bad | 12 |
| complicated | ○ | ○ | ○ | ○ | ○ | ○ | ○ | easy | 13 |
| unlikable | ○ | ○ | ○ | ○ | ○ | ○ | ○ | pleasing | 14 |
| usual | ○ | ○ | ○ | ○ | ○ | ○ | ○ | leading edge | 15 |
| unpleasant | ○ | ○ | ○ | ○ | ○ | ○ | ○ | pleasant | 16 |
| secure | ○ | ○ | ○ | ○ | ○ | ○ | ○ | not secure | 17 |
| motivating | ○ | ○ | ○ | ○ | ○ | ○ | ○ | demotivating | 18 |
| meets expectations | ○ | ○ | ○ | ○ | ○ | ○ | ○ | does not meet expectations | 19 |
| inefficient | ○ | ○ | ○ | ○ | ○ | ○ | ○ | efficient | 20 |
| clear | ○ | ○ | ○ | ○ | ○ | ○ | ○ | confusing | 21 |
| impractical | ○ | ○ | ○ | ○ | ○ | ○ | ○ | practical | 22 |
| organized | ○ | ○ | ○ | ○ | ○ | ○ | ○ | cluttered | 23 |
| attractive | ○ | ○ | ○ | ○ | ○ | ○ | ○ | unattractive | 24 |
| friendly | ○ | ○ | ○ | ○ | ○ | ○ | ○ | unfriendly | 25 |
| conservative | ○ | ○ | ○ | ○ | ○ | ○ | ○ | innovative | 26 |

## 9.3 Consent form

# Medgivande till deltagande i studie

Jag, Felix Lind, studerar kognitionsvetenskap vid Linköpings universitet. Denna studie är en del av mitt kandidatarbete och syftar till att undersöka hur användarupplevelsen påverkas av interaktionen med två olika gränssnitt – ett textbaserat och ett fysiskt.

Som deltagare kommer du först att läsa det näst sista kapitlet ur *”Nils Holgerssons underbara resa genom Sverige”*. Därefter får du interagera och diskuterar kapitlet med en chattbot genom ett textbaserat gränssnitt och en fysisk social robot. Efter varje interaktion fyller du i ett formulär och deltar i en kort intervju.

Alla interaktioner spelas in med ljud och video. Intervjuerna spelas in med ljud för att senare transkriberas till text. Inspelningarna används för att analysera vilka faktorer som kan påverka användarupplevelsen. Endast jag, min handledare och eventuell examinator har tillgång till inspelningarna, som endast kommer att användas för forskningsändamål.

Linköpings universitet är personuppgiftsansvarig enligt Dataskyddsförordningen. All insamlad data hanteras i enlighet med gällande dataskyddslagstiftning.

Deltagande i studien är helt frivilligt. Du kan när som helst avbryta ditt deltagande utan att ange orsak och utan att det medför några negativa konsekvenser. Vid frågor eller om du vill avbryta ditt deltagande, kontakta mig eller min handledare.

Underskrift: ______________________

Datum: __________________